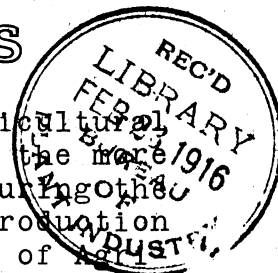


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PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have arrived during the month at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.



No. 111-2.

July-August 1915.

Genera Represented in this Number.

Aleurites	40977	Mangifera	40911
Anacardium	40987		40920-921
Brassica	41031		40983
Canarium	40926	Moringa	40913
	41001	Persea	40912
Citrus	40917		40978-982
Cordia	40988	Phaseolus	40925
Cymbopogon	40896	Polakowskia	41008
Dimocarpus	41053	Pouteria	41003
Dolichos	40903	Prunus	40997-998
Enterolobium	40995	Psidium	40993
Litchi	40915	Saccharum	40989
		Ulmus	40898

Plates:

Litchi chinensis.

Site of New Field Station at Buena Vista, Florida.

Actinidia chinensis, First Fruit Produced in America.

Quetta nectarine, natural size.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the Autumn Catalogue.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

Aleurites moluccana (L.) Willd. (Euphorbiaceae.) 40977. Seeds of the candlenut tree from Manila, Philippine Islands. Presented by Bureau of Agriculture. "A handsome tree with spreading branches, alternate, lobed, pubescent leaves of a pale color, rounded or cordate at the base, with two glands at the top of the petiole. Flowers small, white, in terminal lax cymes; fruit fleshy, coriaceous, globose, with four shallow furrows; seeds one or two, rugose, gibbous. The candlenut tree is widely spread over Polynesia, a small part of Malaysia, and the Philippine Islands. Throughout Polynesia the nuts, strung on coconut-leaflet ribs, serve the natives for candles to light their houses. In Hawaii they are roasted, chopped up, mixed with seaweed, and served at native feasts as a relish. They yield an oil which is very fluid, of an amber color, without smell, insoluble in alcohol, readily saponifiable, and quickly drying. This oil is a mild cathartic, acting in the same manner as castor oil, but causing no nausea nor griping, and having the further advantage of a nutty flavor and of being more prompt in its effects." (Safford, Useful Plants of Guam.)

Anacardium excelsum (Bert. & Balb.) Skeels. (Anacardiaceae.) 40987. Seeds of *nariz* from Trinidad, Santa Clara Province, Cuba. "A magnificent tree, native of South America. It is very rare here in Cuba but there are four or five fine old specimens beside the cart road from Casilda to Trinidad, and it is from these fine specimens (which have been noted by Roig and de la Maza, Flora de Cuba, p. 131) that these seeds were obtained. The *nariz* grows to 60 or 65 feet in height, forming an erect but rather broad, compact head of deep green foliage. As a shade and ornamental tree it should have considerable value. The leaves are entire or nearly so, upon stout petioles one-half to one inch long, the blades obovate, oblanceolate or spatulate, six to eighteen inches long, two and one-half to six inches broad, the apex obtuse to subacute, the base cuneate-attenuate, the surface smooth and deep green above, somewhat paler beneath, the venation raised below. The fruits ripen principally in August; they are dark brown, about an inch long, reniform and flattened, shaped somewhat like a nose, whence the name *nariz*. Unlike the cashew, the fruit stalk is not large and swollen, but is inconspicuous. The seeds are not considered edible. While this tree appears to have no particular economic value, it is worthy of trial as an ornamental, and it would also be of interest to test it as a stock for its relative, the mango." (Popenoe's introduction.)

Brassica chinensis Jusl. (Brassicaceae.) 41031. Seeds of Pakchoi or Korean cabbage from Songdo, Korea. Presented by Rev. C. H. Deal, Anglo-Korean School. "Korean cabbage. I think this is strictly a Korean article, as I have never met with it anywhere else. It grows very much like celery but with leaves very much like a turnip or mustard leaf. The stems are stocky and bleach beautifully. It is used here for making a kind of pickle called Kimchi. The natives call the cabbage Pachoo which would be a good name in case you have not already introduced the seed under another name. The seeds are planted in the fall, about September, in hills about fifteen inches apart each way and thinned out to one stalk to a hill. It is not gathered in until after frost, just before the first heavy freeze. It takes a good deal of water and rich land and plenty of fertilizer." (Deal.)

Canarium amboinense Hochr. (Burseraceae.) 41001. Seeds from Buitenzorg, Java. Presented by the Director, Botanic Garden. "A burseraceous tree 80 to 90 feet high, closely related to *C. moluccana* but differing in the nearly smooth, oblong fruit, that of *C. moluccana* being very rough and very much more elongate. This tree branches about 25 feet from the ground, trunk about eight feet in circumference; possesses large arching prop-roots at the base; bark smooth and white; crown umbrella-shaped." (Hochreutiner, *Plantae Bogoriensis Exsiccatae*, p. 55.)

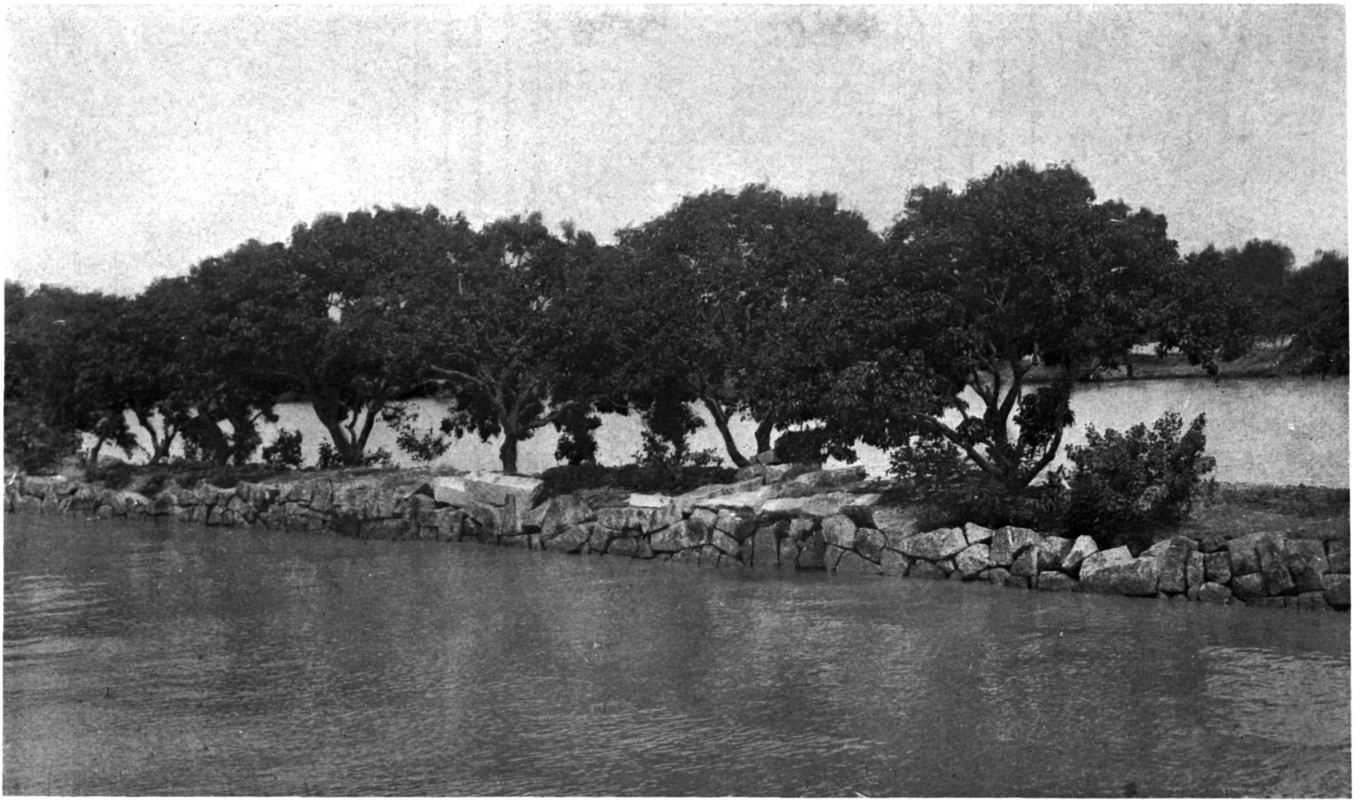
Canarium ovatum Engler. (Burseraceae.) 40926. Seeds of Pili nut from Manila, Philippine Islands. Presented by Mr. H. T. Edwards, Director, Bureau of Agriculture. "Because of the easy digestibility of these nuts, they are being used in increasing quantities for the preparation of an infant food, the excess of oil being removed and the nuts ground to a paste. These nuts have been gathered by one of our representatives residing on the island of Catanduanes and are fresh stock, hulled by the cold-water process." (Adn. Hernandez.)

Citrus grandis (L.) Osbeck. (Rutaceae.) 40917. Seeds of pomelo from Paramaribo, Dutch Guiana. Presented by Dr. J. A. Samuels, who secured it from Mr. Bueno de Mesquita. "Alamoen. A new type of citrus fruit. As the fruit is apparently a new type of grapefruit, it may possibly be resistant to the canker and should be made a subject of investigation as soon as possible." (D.G. Fairchild.) This fruit, which is most likely the largest variety of the Citrus, is called Guidieon-apple in Surinam. According to

Mr. Mesquita, there is a difference between *Lamoen* (in English *Alomoes*) and *Limoen*, or *Citrus limonum* Risso. The Dutch name of *Alomoes* is *Pompelmoes* and this is not cultivated on a large scale in Surinam. They are planted in the house gardens in the city and in the country. The fruit has not yet been selected and has not been used for industrial purposes." (Samuels.)

Cordia alba (Jacq.) Roem. & Schult. (Boraginaceae.) 40988. Seeds from Trinidad, Santa Clara Province, Cuba. "*Ateje*. A large shrub, 15 to 18 feet high, common along the eastern edge of the valley of San Luis. It is bushy, branching close to the ground and sending up long stiff shoots well furnished with dark green foliage. The leaves are alternate, obovate to ovate-elliptical, three to four inches long, with entire margin and the surface covered with short, bristly hairs; petioles about an inch long, terete. The flowers, which are pale yellow and about one-half inch in diameter, are borne in broad, flat-topped corymbs sometimes a foot across. The oblong-obovate fruits are half an inch in length and pearly white when ripe, enclosing a single large seed. It is, apparently, a good meliferous plant, and of considerable ornamental value. For trial in south Florida and California." (Popenoe.)

Cymbopogon coloratus (Hook.) Stapf. (Poaceae.) 40896. Seeds of lemon grass from Suva, Fiji Islands. Presented by Mr. C. H. Knowles, Superintendent of Agriculture, Nasinu Experiment Station. "This grass is growing well on sloping ground, the soil of which is brownish red, not very good in quality. The ground was first ploughed and harrowed, and young plants from a seed-bed set out at distances of three feet. The space between the young plants was kept clean by weeding and the plants soon grew and covered the ground. Plants may be set out any time during wet weather, but from September to December is best. Under normal conditions the grass flowers about April or May, when about four feet high. After the grass has been cut it flowers irregularly during the year. The best time to cut appears to be when the grass is from three to four feet high but before it is heavily in flower. Subsequent cuttings may be made whenever the grass is over three feet high. Two cuttings may be depended on, while three may be made unless dry weather sets in for some time. The young grass is richer in oil than the older grass, but the total yield per acre obtained in the same time is less." (Bulletin No. 6, Fiji Department of Agriculture.)



A row of Litchi trees (*Litchi chinensis*) in Canton, China.

The dykes which separate the rice fields in South China are often planted with fruit trees and a favorite tree for these situations is the Litchi (otherwise spelled Leitchiee, Leichee, Leitchi, or Lichee). It appears to be able to stand light frosts when once established but when young it is easily killed by freezing temperatures. A single tree of the Litchi has fruited at Santa Barbara, California, and young trees are growing at several places in Florida. Photograph by G. Weidman Groff of the Canton Christian College.



Baskets of Fresh Litchi Fruits in Canton, China.

The Chinese litchi (*Litchi chinensis*) is already familiar to the American public but few know that it is not a real nut but a dried fruit or that there are scores of different varieties of it. They are among the most delicate flavored of all fruits, having an almost perfumed character about them. The trees are grown like the one shown in the cut along the dykes which divide the rice fields from the canals. Photograph by G. Weidman Groff of the Canton Christian College.

Dimocarpus longan Lour. (Sapindaceae.) 41053. Seeds received from Little River, Florida. Presented by Mr. Charles Simpson. "The *longan* tree is likewise a native of Southern China, where it is cultivated for the sake of its fruit. Its leaves have generally five pairs of leaflets much resembling those of the *litchi*, but it is readily distinguished by its flowers having a deeply five-parted calyx. The *longan* is a smaller fruit than the *litchi*, varying from an inch to an inch and a half in diameter, and quite round, with a nearly smooth, brittle skin of a yellowish-brown color. It contains a similar semi-transparent pulp of an agreeable sweet or subacid flavour, and is largely sold in the markets." (Treasury of Botany, vol. 2, p. 784.) To be tested as a stock for *Litchi chinensis*.

Dolichos lablab L. (Fabaceae.) 40903. Seeds from Peking, China. "A brown-seeded variety of hyacinth bean, much used by the Chinese as a vegetable, preferably sliced green and only slightly cooked. These hyacinth beans are much grown as a home vegetable along fences of kaoling stems and even in between maize. They are also quite decorative. Chinese name *Ching pien doh*, meaning 'Green flat bean'." (Meyer's introduction.)

Enterolobium cyclocarpum (Jacq.) Griseb. (Mimosaceae.) 40995. Seeds from Santiago de las Vegas, Cuba. Collected by Mr. Wilson Popenoe, of this Bureau. "*Oreja de judio*. A fine leguminous tree extensively used in this region as a shade tree along avenues and carreteras. Of the four or five different species used on the rock road from Santiago de las Vegas to Habana this is certainly one of the best, growing to a considerable height and branching to form a symmetrical, rounded head of deep green foliage, giving a fairly dense shade and presenting an attractive appearance. While it has already been planted in Florida, I know of no avenues of it in that state, and it might advantageously be propagated at Miami, I believe, with the intention of testing it as an avenue tree." (Popenoe.)

Litchi chinensis Sonnerat. (Sapindaceae.) 40915. Seeds from Canton, China. Presented by Mr. G. Weidman Groff, Canton Christian College, through Mr. F. E. Shamel. "*Haak-ip lit-chi*. The litchi seems to do best in about this latitude. It succeeds somewhat north and south of this but I should say cannot stand much frost. We have a light frost here almost every year but not heavy enough to do much damage. It seems to do best on dykes of low land where its roots can always secure all the water needed and where they are

even subject to submersion. In some places they grow it on high land but not nearly so successfully. I have never seen a budded or grafted litchi tree, and I understand it is never done. Litchi trees are either inarched or layered, the latter being the more common and the most successful. If inarched it is on litchi stock. The common practice in inarching is to use the *Loh Mai Chi* variety for scions and *San Chi* variety for stock. The seeds of the various varieties vary greatly in vitality. I am told that there is absolutely no success with seedlings, though seeds of certain varieties germinate quite readily. This variety, the *Haak-ip* is one of the most popular and is now on the market. The seed of this variety germinates quite readily though not so well as the *San Chi*." (Groff.) See Plate and Notes from foreign correspondent.

Mangifera indica L. (Anacardiaceae.) Mango budwood collected in Cuba by Mr. Wilson Popenoe, of this Bureau. 40911. "Jovellanos, Matanzas Province. *Luisa mango*. A seedling of the Philippine race. Luisa is a typical Philippine mango, long, slender, and pointed at the apex, varying somewhat in form and size. A good specimen will weigh eight to ten ounces. The color is lemon yellow, as in others of the type. The fruits are not yet ripe, so I have not had an opportunity to test the quality, but according to Prof. Earle it is excellent. Seedlings of the Philippine race are frequently rather unproductive, although the fruits are produced in clusters of two or three to about ten, and in a good season an enormous crop may be produced. Because of its excellent flavor and quality, this variety should be given a trial at Miami." "Cienfuegos. *Manga mamey*. A fine seedling type, found only in the Quinta Aviles, so far as known. In general form it is broadly cordate, very short (just about as broad as long), slightly compressed laterally, the base flattened and very slightly oblique, the apex with a suggestion of a beak. In weight it averages eight to 12 ounces. The stem is inserted in a shallow, narrow, almost regular cavity. The surface is smooth, greenish orange-yellow to orange-yellow in color, blushed around the base with reddish salmon. The dots are large and conspicuous, a distinguishing feature of the type as frequently with other members of the mango group. The skin is thick and very tough, the flesh bright yellow-orange, meaty, moderately juicy, with very little aroma. The flavor is acid, pleasant, fairly spicy; fiber not very objectionable except around the ventral edge of seed, where it is long and fine. The seed is long, rather thick, with two to five embryos in the speci-

mens examined, and an exceedingly hard, woody endocarp. In season this type agrees with *Chino* being early to mid-season in ripening. While somewhat more fibrous than the best Indian varieties grown in Florida, it is far above the average Cuban seedling in quality and freedom from fiber, and is here considered a very choice mango. The trees appear to be productive. For trial in south Florida." (Popenoe.) 40921. "Cienfuegos. *Mango Chino*. This is one of the largest and best seedling types in Cuba. In general form *Chino* is broadly cordate, plump, usually somewhat oblique at the base and rounded at the apex. It weighs 10 to 16 ounces. The stem is inserted in a shallow, somewhat irregular cavity. The surface is smooth, greenish yellow to dull cream yellow in color, overspread or blushed around the base with carmine. The skin is very thick and tough, making the fruit an excellent shipper. The flesh is deep yellow in color, orange yellow toward the seed, of very firm and meaty texture, juicy, and with a very faint but pleasant aroma. The fiber is more abundant than in our best India varieties but much less so than in the average Cuban seedling; it is long at the ventral edge of the seed, but comparatively short elsewhere. The flavor is rich, spicy, and very pleasant, the seed oval, rather thin, and not objectionably large. It usually contains four to six embryos. *Chino* is rather early in season, and the trees seem to be productive." (Popenoe.) 40983. "Santiago de Cuba. *Biscochuelo mango*. This is probably the best type of mango grown in the vicinity of Santiago de Cuba, and excepting the *Filipino*, one of the very best in the island. It is quite common here, and very abundant on the markets, where the fruits are sold at \$2 per hundred. *Biscochuelo* is a fruit of rather unique form differing from all others I have seen in Cuba. It is oval to subreniform, decidedly oblique, the left shoulder rounded to very broad and marked by a deep suture which extends some distance down the ventral side of the fruit, the right shoulder usually falling abruptly. The apex is rather sharp and sometimes almost beaked. In cross section the fruit is broadly oval. The weight is from eight to 14 ounces. The general color, when the fruit is fully ripe, is clear light orange, but as seen in the market they are frequently tinged with green. The skin is thick and tough, the flesh bright orange-yellow, firm and meaty, with a faint but pleasant aroma and very little fiber for a seedling type. The flavor is sweet even when the fruit is still quite hard, and when fully ripe it is very pleasant. The seed is reniform in outline, with long fiber on the ventral edge and short stiff fibers elsewhere, the em-

bryos one to five in number. Most of the specimens examined were polyembryonic. Seems worthy of trial in south Florida. The tree fruits well in this region." (Popenoe,)

Moringa oleifera Lamarck. (Moringaceae.) 40913. Seeds from Cuba. Collected by Mr. Wilson Popenoe, of this Bureau. "*Palo blanco*. A small ornamental tree which is planted in the gardens of the region. As commonly seen here it is a tree of about 15 or 20 feet in height, erect, and of very attractive appearance. The leaves are pinnately compound, often nearly a foot in length, of pleasing light green color, with opposite, shortly petiolulate obovate-elliptic leaflets rarely over half an inch long. The flowers are borne on axillary panicles six to eight inches long, they are white, about an inch long, and faintly fragrant. As they are produced in great abundance they make the tree effective as an ornamental. The slender triangular seed pods are often a foot in length; when ripe they dehisce and scatter the ground with seeds. *Palo blanco* is considered to be an antidote for manchineel (*Hippomane mancinella*) poisoning. As an ornamental it seems worthy of trial in south Florida and possibly also in southern California, in regions protected from severe frosts." (Popenoe.)

Persea americana Miller. (Lauraceae.) From Cuba. Budwood collected by Mr. Wilson Popenoe, of this Bureau. 40912. "Jovellanos, Matanzas Province. *Luisa avocado*. The parent tree of this variety is growing in the garden at the Casa Vivienda, on the Nueva Luisa sugar estate. It is a large seedling, apparently 25 years old at least. Its particular value lies in the fact that the fruit is said to ripen in October, after nearly all the avocados are gone. The fruits, which are only about three inches long at present, are broadly obovate in form, with no indication of a neck, the skin light green when ripe and very thick. Judging from the immature fruit, the seed cavity is not large and the seed fits in it snugly. According to the gardener who was in charge of the place, the fruit is of excellent quality, with a rich flavor and no fiber. The tree, which stands among a lot of others beside a small stream which trickles through the garden, is bearing a good crop of fruit. The only late avocado at present grown commercially in south Florida is the *Trapp*. It seems worth while to try out other varieties which ripen late in the season, and *Luisa* has been obtained with this view. The season is earlier here than in Florida, generally speaking, and an avocado which ripens here in October may hang on the tree



The site of the new Plant Introduction Field Station at Miami (Buena Vista), Florida before any improvements whatever had been made upon it. A complete list of the native flowering plants to be found upon the site has been made by Prof. Chas. T. Simpson and a small area has been set aside on which will be maintained as long as feasible a sample of the original flora. The most conspicuous plants in the photograph are the Cuban Pine (*Pinus caribaea*) and the Palmetto (*Inodes (Sabal) etonia*). Mr. Fairchild and Mr. Simmonds are standing at the left.



The Miami oolite rock formation, which underlies the new Miami Plant Introduction Field Station. When these large holes in the rock are filled with good soil and a sufficient layer of humus is maintained over the rock surface tree roots seem to find very congenial conditions for growth there.

in Florida until even later than this, because of the cool autumn weather." (Popenoe.) 40978. "Placetas, Santa Clara Province. *Bartlett avocado*. A rather remarkable variety growing in the garden of Dr. Alberto Bartlett of this town. It is said to bear two crops a year; the first crop is early, and is now ripening, the second crop commences in December and the last fruit was eaten this year on May 8th. In form this fruit is broadly pyriform, and in size about four inches long by three inches in thickness. The color is bright green, the surface smooth. The skin is rather thin, scarcely over one mm. in thickness. The flesh is creamy yellow near the seed, changing to pale green near the skin, of good texture and said to be of good quality, though not excellent. The seed is about the average size, but not objectionably large; the seed coats are rather thick and loose, but I found no specimens in which the seed rattled in the cavity. The tree is evidently very productive, judging by the present crop. It is growing in a very favorable situation, however, and receives a good deal of fertilizer. The fruit is attractive in appearance, and seems well worthy of a trial in south Florida." (Popenoe.) 40979. "Placetas, Santa Clara Province. *Don Carlos avocado*. A small variety, said to be of exceptionally choice quality, from the Quinta Aguas Azules of Dona Serafina Wilson, Viuda de Bartlett, near Guadalupe, about 15 miles from Placetas. This fruit is almost perfectly round in form, and of light yellowish green color. The skin is thick, the flesh of fine, oily texture, and the seed very small in comparison to the size of the fruit. The tree is bearing an excellent crop and can probably be considered productive. It ripens its fruit from August to October, and is not, therefore, a very late variety, but because of its good quality it is considered worthy of a trial in south Florida. It was the favorite fruit of Don Carlos Bartlett, the former owner of the Quinta Aguas Azules, and has been named after him." (Popenoe.) 40980. "Placetas, Santa Clara Province. *Guadalupe avocado*. A late variety from the Quinta of Joaquin Wilson at Guadalupe, about 15 miles from Placetas. This is a broadly pyriform fruit, narrowed at the base but not noticeably 'necked' and somewhat oblique at the apex. It will probably weigh 12 to 14 ounces when ripe. The color is green, sometimes mottled with maroon; the skin is rather thin, about one mm. in thickness. The flesh, which seems to be entirely free from fiber, is said to be of good flavor. The seed is of about the average size, not objectionably large, and apparently tight in the cavity. This tree produces the latest fruits of any on the Wilson farm, but the crop does

not all ripen late, and only a few fruits hang on until February. At the present time there are fruits in various stages of growth upon the tree, some almost fully grown, others still quite small. Joaquin Wilson claims that he has picked ripe fruit from this tree during a large portion of the year. It does not appear to be a very heavy bearer, however. For trial at Miami, Florida." (Popenoe.) 40981. "Placetas, Santa Clara Province. *Merced avocado*. The latest variety growing in the Quinta Aguas Azules of Dona Serafina Wilson, Viuda de Bartlett, at Guadalupe, about 15 miles from Placetas. The fruit is said to remain on the tree until February. It is broadly pyriform, very similar to *Pollock* in shape, but probably not over one pound in weight, judging by its present size. The color when ripe is said to be green, and the quality excellent. The tree is old and in poor condition; it is not bearing a good crop this season, but might fruit more heavily under favorable conditions. For trial in south Florida." (Popenoe.) 40982. "Placetas, Santa Clara Province. *Wilson avocado*. A late variety, said to be of unusually good quality, from the Quinta of Sr. Joaquin Wilson at Guadalupe, about 15 miles from Placetas. This is a rather small fruit, probably not over 8 to 10 ounces in weight, round to very broadly oval in form, usually somewhat oblique at the apical end. The color, when ripe, is said to be very light green. The skin is two mm. in thickness. The flesh is perfectly free from fiber, and said to be of unusually fine texture and rich flavor. The seed is very small in proportion to the size of the fruit. According to Sr. Wilson, after whom the variety is named, it ripens about Christmas. The tree is carrying an excellent crop and seems to be all that could be desired in regard to productiveness. While rather small in size, this seems to be a valuable fruit, and should be tried in southern Florida." (Popenoe.)

Phaseolus lunatus L. (Fabaceae.) 40925. Seeds from Marseilles, France. Presented by Dr. E. Heckel, Director, Colonial Museum. "*Kalamaka* of the Malagasies. Cape beans have taken the second place among the agricultural products of Madagascar in exportation. In commerce, this large bean bears different names, *haricot d'Orleans*, *haricot de Lima*, *de Parague*, etc. It has been known in Madagascar for a very long time, and it is mentioned in the accounts of voyages before the 17th century. Its culture is practiced almost exclusively in the provinces of Tulèar and Morondava, situated at the southwest of the island. The alluvial soils of the deltas of this region suit it admira-

ably, particularly those which are rich in micaceous elements. These are ordinarily recovered from *bararata*, large reeds (*Phragmites communis*?) attaining four meters in height, and submerged during the winter. The soil is prepared by superficial working. This preparation commences in March and April, as soon as the waters subside. The bararatas (reeds) are cut and burned; they shoot again, but the young shoots are broken down with a stick and this encroaching vegetation disappears. The seeds are planted in holes from three to four meters apart in March and April. Harvest takes place from September to December. Almost all of the crops of Cape beans are irrigated. Sells in Marseilles for 65 francs per 100 kilos." (Heckel.)

Polakowskia tacaco Pittier. (Cucurbitaceae.) 41008. Seeds of *tacaco* from Costa Rica: Presented by Mr. Carlos Wercklè, at the request of Mr. Van der Laat, Director, Department of Agriculture. "A cucurbitaceous plant, the fruit of which is used as a green vegetable. It is a near relative to the chayote, but the fruit is smaller, fusiform, set with stiff spines at the base and of quite a distinct taste. It is one of the primitive foods of the native Indians of Costa Rica, where it grows wild in fresh, shady places of the temperate region, and its use as a vegetable has been readily adopted by the Spanish Costa Ricans. Nowadays the plant is at least semi-cultivated on the central plateau. To grow it, a whole mature fruit is set in a rich, loose leaf mould, with the spiny end up and almost showing at the surface. (They do not sprout if planted in common garden earth.) The vines spread on the ground or on low bushes or supports. The fruits, which are about two and one-half inches long and one and one-half inches broad, hang from short peduncles and are picked when still green. After taking away the basal spines they are boiled in water, either whole or cut into small pieces, or pickled, or made into preserves. They are also a favorite addition to the native vegetable soups." (H. Pittier.)

Pouteria caimito (Ruiz & Pav.) Radlkofer. (Sapotaceae.) 41003. Seeds of *abiu* from Lavras, Minas, Brazil. Presented by Mr. Benjamin H. Hunnicutt, Escola Agricola de Lavras. "A timber tree with edible fruits. The fruit is a beautiful golden yellow and is the shape of the fruit of the *limao do matto*, *Rheedia brasiliensis*. The fruit is somewhat sticky but of a delicious flavor. The one we have on our place is a beautiful bush at present and would do very well as an ornamental plant. It is found in the states of Espirito Santo, S. Paulo and Minas Geraes." (Hunnicutt.)

Prunus maximowiczii Rupr. (Amygdalaceae.) 40997. Seeds of Maximowicz's cherry from Jamaica Plain, Massachusetts. Presented by Professor C. S. Sargent, Arnold Arboretum. "A tree about 25 feet high, with horizontal branches. Leaves obovate, about one and one-half inches long, somewhat coarsely toothed, nearly glabrous; petioles slender, about one-half inch long. Flowers white, on slender hairy peduncles, one or two on each flowering shoot. Fruit crimson, the size of small peas. Japan." (Kew Bulletin, New Garden Plants, 1903.)

Prunus sargentii Rehder. (Amygdalaceae.) 40998. Seeds of Sargent's cherry from Jamaica Plain, Massachusetts. Presented by Professor C. S. Sargent, Arnold Arboretum. "A species which has been confused with *P. pseudo-cerasus* from which it differs by having all its parts glabrous. It is nearest allied to *P. serrulata*, differing by having sessile umbels and more coarsely toothed leaves. Japan." (Kew Bulletin, New Garden Plants, 1909.)

Psidium guayabita A. Richard. (Myrtaceae.) 40993. Seeds of guayabita from Santiago de las Vegas, Cuba. Presented by Mr. Juan T. Roig, Botanist, Agricultural Experiment Station. "This is a species peculiar to the western portion of Pinar del Rio, where it is called *guayabita del Pinar*. The fruit is edible but not very valuable. A very popular aromatic liquor is prepared from the fruit and there is a factory in Pinar del Rio which has patented the product with the name of *Licor de guayabita del Pinar*." (Roig.)

Saccharum ciliare Anderss. (Poaceae.) 40989. Seeds of elephant grass from St. Kitts, British West Indies. Presented by Mr. F. R. Shepherd, Curator, Botanic Station. "It is the *sara* of the classic authors of India, and is met with throughout the plains and lower hills and distributed to China. In the Panjáb it often covers large tracts of country and is frequently planted in lines or dividing hedges, especially in low-lying localities subject to periodic inundation. Sir William Jones says 'This beautiful and superb grass is highly celebrated in the Puránas, the Indian God of War having been born in a grove of it, which burst into flame; the gods gave notice of his birth to the nymph of the Pleiades, who descended and suckled the child thence named Carticeya. The *casa* (*kasa* or *kans*) vulgarly *casia* (*S. spontaneum*) has a shorter culm, leaves much narrower, longer and thicker hairs, but a smaller panicle, less compound, without the purplish tints of the *sara*; it is often described with praise by the

Hindu poets for the whiteness of its blossoms, which give a large plain, at some distance, the appearance of a broad river. Both plants are extremely useful to the Indians, who harden the internodal parts of the culm, cut them into implements for writing on their polished paper. From the munji, or culm, of the *sara* was made the maunji, or holy thread, ordained by Menu to form the sacerdotal girdle, in preference even to the cusa-grass. Munji fiber is obtained from the leaf-sheaths; the blades are the sar or sara used in thatching houses and as a paper material; the contained flowering stem is the bind or vind; the panicle or flowering stem is the sirki, til or thili, used in thatching boats, carts, etc.; sentha or kana is the lower, stronger portion of the flowering stem, used in the manufacture of chairs, stools, tables, baskets and screens; and tilak, tilon or ghua are names that denote the flowers. Some of these names, such as munji and sara, have been supposed to denote the products of different species, instead of different parts of one and the same plant, hence has originated much of the confusion that prevails. Sara is used in paper-making and munji as a textile fibre. The much prized munji is strong, elastic and has a wonderful power of enduring moisture without decaying. It is extensively employed in the manufacture of cordage, ropes, the famed Delhi mats, and in the preparation of baskets, etc. Munji mats are reported to be proof against white ants, but are hard on shoe leather, harsh to the foot and fatiguing when walked on for any length of time. These are largely produced in Allahabad, Agra, Delhi, and are traded in all over India, and within recent years have begun to find their way to Europe. In the early spring the old grass is often fired when shortly after a crop of young leaves is produced from the stools, which is much valued as fodder." (Watt's Commercial Products of India, p. 929.)

Ulmus pumila L. (Ulmaceae.) 40898. Seeds from China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "The Chinese elm, used all over northern China and Manchuria as an avenue, shade and timber tree. Resists droughts, extremes of heat and cold, and neglect remarkably well; will be a good shade tree for the semi-arid northern regions of the United States. The Chinese carts are mainly constructed from the wood of this tree. Has proven itself to be adapted as an ornamental tree over a very extended territory in the United States." (Meyer.)

NOTES FROM CORRESPONDENTS ABROAD.

China, Canton. Mr. F. D. Cheshire, reports under date of July 8, 1915, on the lichee: The lichee, one of the most widely known fruits throughout China, is produced in South China, chiefly in the provinces of Fukien and Kwangtung; it is also produced in Szechuan. A small quantity is grown in other southern provinces, but none whatever in the north. It is said that lichees grown in other than the three provinces named are inferior in quality and almost unfit for edible purposes.

For the sake of accuracy, this report will be confined to the lichees grown only in Kwangtung Province.

The principal lichee producing districts in Kwangtung Province are Namhoi, Pun Yu, Tsang Shing, and Tung Kun. Some lichees are grown in the Heungshan, Shuntak, and Samshui districts, and while they are produced in abundance in the Yeung Kong and Shui Tung districts, they are of a very inferior quality.

The fruit of the lichee tree, when plucked, rapidly deteriorates, and can be kept in its original state for only three days at most. A plan has been adopted for preserving the fruit by storing it in bamboo after sprinkling with a weak salt solution and sealing both end of the bamboo with clay. In this manner the fruit remains fresh for a period of about two weeks, allowing of its being exported to Shanghai and Peking, and ports on the Yangtsze River.

Dried lichees are very popular in foreign countries. The fruit is dried in two ways, - by sun and by fire. The sun-dried lichee, when under the drying process, is likely to deteriorate and, consequently, it commands a better price; besides it has a finer flavor than the fire-dried fruit. There are but two or three species of the lichee which are suitable for drying purposes, viz., the *no-maichi*, the *kwai-mi*, and the *wai-chi*.

The purchase of lichees by the wholesale dealers from the producers is largely one of speculation, the former bargaining with the latter for the fruit during the months of April and May, while the trees are yet in blossom, a certain amount being agreed upon for each tree. In the event of the tree being unfruitful, the purchaser must suffer the consequences, and vice versa.

The actual quantity of fruit produced annually is a difficult matter to ascertain accurately, but from information received from the lichee producers, the total amount of lichees annually produced in the Kwangtung Province is estimated at 1,500,000 pounds.



The Yang Taw vine (*Actinidia chinensis*) bearing a single immature fruit; the first to be produced in America.

The vine was trained over the porch of a private house at Chico, California, and produced a number of fruits.

When trained high allowing only a single stem to grow and form a trunk and the leafy branches to spread out over a pergola this rank growing vine produces a very satisfactory shade.

This fruit never reached maturity, so that at present, we are unable to corroborate the statements of travellers in China who claim the fruit is of considerable value for jams and preserves. Photograph by R. L. Beagles, October 1915.



The Quetta Nectarine(S.P.I. No.18235).

The seeds were collected from the best nectarine trees in Quetta, Baluchistan, at an altitude of 6000 feet by Lieutenant W. L. Maxwell of the 127th Baluchistan Light Infantry. The large size and good color of this variety together with its excellent flavor make it very promising. Photographed at Chico, Calif., by R. L. Beagles from the first fruits to ripen in this country.

The selection of suitable soil for the planting of lichee trees is most essential. Alluvial soil lying along the banks of fresh water streams is to be preferred. A soil composed of sand and mud in about equal proportions and about six feet above water is considered ideal. The lichee tree is extremely sensitive to cold weather and thrives best in warm climates. Its two deadliest enemies are salt water and cold, and for this reason it is difficult to grow lichee trees even in South China.

An abundance of manure is essential if the tree would flourish. In winter the young trees must be protected from the cold by wrapping the trunks with straw and covering the base of the tree with a mixture of hay and mud, and this process must be continued until the trees have reached the age of forty to fifty years, when it may be dispensed with.

The season for planting the lichee tree is in the spring. The seed or kernel from the fruit is placed in the ground and protected with manure and mud. When the tree is one year of age, it is transplanted into a soil adjacent to the bank of a stream, if possible.

At the age of five years, the tree comes into bearing, but the fruit is of a poor quality and gradually improves as the tree matures. Fruit of a good quality, as a rule, can not be expected until the tree is thirty to forty years of age. The life of the lichee tree is several hundred years.

(I think the chinese cannot graft the litchee at all. The few specimens that I saw were inarched ones; perhaps they might layer them also. Added note by F. N. Meyer.)

In April or May the lichee tree is in blossom, and if during these months it is visited by strong winds and heavy rains, in all probability it will not bear fruit.

It is said by the Chinese, and it is a very interesting fact to note, that prior to the plucking of the tree, it is immune from the ravages of insects and birds. The tree is protected, the Chinese say, by a kind of black-winged insect which spins its web in the tree and emits an unpleasant odor which effectually protects it from destructive insects and birds. But if any of the fruit is plucked, the tree is deserted by the black-winged insect and is left a prey to its enemies. Accordingly, the farmer who is wise will take the precaution to strip the tree of all of its fruit as quickly as possible.

Generally speaking, the lichee harvest occurs in the months of June and July, one variety after another coming to maturity. The poorest fruit marks the beginning and end of the season, the best coming in during the middle of the season.

The different species of the lichee are too numerous to mention, but the following are commonly considered as the most popular:

1. *Yuk-ho-po* - "jade purse" - having a thick skin, green color, a large kernel, and a sour taste. It is inferior in quality, but as it is the first to make its appearance, coming in about the 5th of May, it is given a good reception.
2. *Hark-yip* - "black leaf" - dark-red in color, delicate skinned, fragrant and sweet. This is one of the best lichees and comes into bearing about June 6th. The best of this variety is produced in the Tung Kun district and the Shui Tung district. It is plentiful in the market and very popular.
3. *Kat-jat-kwo* - "cockroach fruit" - dark-red, thick-skinned, pear-shaped. This fruit is inferior in quality.
4. *Wai-chi* - "Wai fruit" - the most common variety of lichee on the market in this province. Some are light and some dark-red in color, and are thin-skinned. It is produced between the 21st of May and the 21st of June, and is considered a good variety.
5. *Chui-ma-chi* - "green-spotted lichee" - of a green color and sour taste. There are very few in the market.
6. *Tong-pok* - "sugar sheets" - of a dark-red color, pearshaped, and sweet flavor, but not of a delicious taste. It is produced for the most part in the Namhoi and Samshui Districts.
7. *Kwai-mi* - "cinnamon flavor" - light-red, rough-skinned, small kernel, very fragrant and sweet. One of the best varieties of lichees. It is placed on the market about June 21st. The best are obtained from Lo Kong Tung, in the Pun Yu district.
8. *Shan-chi* - "hill fruit" - of a red color and round shape; slightly sour.
9. *Hom-shiu-chi* - "Magnolia fruit" - light-red, small-sized, sweet tasting, but not delicious. Attached to each lichee of this species is a smaller green one.
10. *No-mai-chi* - "glutinous rice-cake". This is one of the most popular lichees; thin-skinned, fragrant and sweet, and good appearance. It has a very small kernel and a heavy pulp. It is produced in the month of June and comes mostly from Pun Yu and Canton.
11. *Fei-tsze-siu* - "smiling Imperial Concubine" - half red, half green, round-shaped, thick rough skin; good flavor, with a slightly sour taste. It is produced at the end of June, mostly in Shiu Kwan and Ying Tak, and is considered a good fruit.
12. *Chun Fung* - "Phoenix lichee" - small, round, of a red

color and thick skin; not good in taste.

13. *Heung-lai* - "fragrant lichee" - produced in the Sun Hing district; small and round, of a red color and rough-skinned; fragrant and sweet. It was formerly an article of tribute to the Throne. The *heung-lai* is produced at the the end of June.

14. *Kwa-luk* - "green mounted lichee". This lichee is grown in the Tsang Shing district. Its characteristics are a round shape, fine skin, and delightful red color; fragrant and sweet. It is considered superior to the *no-mai-chi* and the best lichee that can be had in Kwangtung Province. It is difficult to obtain in the market. This species usually grows in pairs, - one large red, and the other a small green. The green one is not edible. The genuine *kwa-luk* is grown from only one tree, which is inside the Tsang Shing Magistracy. During the Manchu regime the fruit of this tree was accepted as tribute by the Emperor. The lichees of this variety grown in the neighborhood are also considered as good fruit, but they are almost monopolized by the officials. The *kwa-luk* lichee is chiefly used for presentation purposes between officials, from two to eight lichees being placed in one box. The genuine *kwa-luk* can be obtained only with great difficulty.

15. *Sheung-shu-wai* - "Chancellor's wai-chi" - produced in the Tsang Shing district. It resembles the *wai-chi* in appearance, but its taste is that of the *no-mai-chi*. It is one of the best varieties of the lichees and is placed on the market about the 7th of July.

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